

REMARKS

The Specification has been amended to correct minor clerical errors and to employ more idiomatic English consistent with the Examiner's observations in paragraph 12 of the Action. A substitute drawing FIG. 2 has been filed to address the Examiner's objection to the drawings. The title has been amended as suggested by the Examiner. Finally, the claims have been amended to address the language objections and §112 rejections, and also to better define the claimed invention and to distinguish the claimed invention from the prior art. Claims 2 and 18 have been canceled.

Turning to the art rejections, and considering first the several art rejections based on Zhang et al. ("Controllable Method for Fabricating Single-wall Carbon Nanotube Tips," Applied Physics Letters, August 2000), taken alone or in combination with one or more secondary references as set forth in paragraphs 14-16 and 22-28 of the Action, the Zhang et al. literature publication, which is a publication of the Applicant, was published after the filing date of Applicant's underlying priority Application, JP 11-359579 filed December 17, 1999. A certified copy of Applicant's underlying priority Application was previously filed with this Application. Accompanying this Amendment is a Verified English Translation of the priority Application, thus perfecting Applicant's priority claim, and removing the Zhang et al. literature reference as citable prior art.

Turning to the several art rejections based on Jin et al. (U.S. Patent No. 6,283,812) alone or in combination with one or more secondary references, Jin et al. is quite different from Applicant's claimed invention. Applicant's claimed invention provides a method of processing a nanotube which permits one to accurately define an end of the nanotube. Applicant achieves this

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by contacting a nanotube with a reactive substrate having a defined edge, and causing a solid state reaction between a part of the nanotube and the reactive substrate so as to produce in a selected part of the nanotube a reaction product having a boundary aligned with the defined edge of the substrate. The nanotube may then be separated from the reaction product at the boundary to define an end of the nanotube. Since the edge of the reactive substrate may be accurately formed, the boundary of the reaction product may be accurately controlled. Thus, the end of the nanotube may be accurately formed. Neither Jin et al. nor any of the secondary references teaches or suggests this.

Considering first the rejection of claims 1-3, 9-11, 13, 17, 18, 20, 21, 27-29 and 31 as anticipated by Jin et al., claims 2 and 18 have been canceled, thus rendering moot the rejection of those claims. As to the remaining claims, independent claims 1 and 21 both require contacting a nanotube with a reactive substrate having a defined edge, carrying out a solid state reaction (claim 1) or heat treatment (claim 21) in a selected region of the nanotube so as to produce a reaction product having a boundary aligned with the defined edge of the reactive substrate. Jin et al. doesn't teach this. Rather, Jin et al. uses a hot blade in a sliding, sweeping or rotating motion (col. 6, lines 2-3) to top or mechanically remove portions of nanotubes. Jin et al. also teaches dissolving the ends of the nanotubes by dipping the nanotubes into a molten metal (col. 6, lines 39-46). In another embodiment, Jin et al. rubs the ends of nanotubes against a hot solid metal to dissolve the carbon ends in the solid metal (col. 7, lines 4-7). In yet another embodiment, Jin et al. encapsulates aligned nanotubes in a solid matrix and then polishes the array. None of these methods taught by Jin et al. defines an end of a nanotube by producing a reaction in a selected part of the nanotube having a boundary aligned with a defined edge of a reactive substrate, as

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required by Applicant's claims. Accordingly, neither claim 1 nor claim 21, nor any of the claims dependent directly or indirectly thereon, can be said to be anticipated by Jin et al.

Nor can Applicant's claims be said to be obvious from Jin et al. Nowhere does Jin et al. teach or suggest causing a solid state reaction between a selected part of a nanotube and a reactive substrate having a defined edge so as to produce in the selected part a reaction product having a boundary aligned with the defined edge of the reactive substrate, as required by Applicant's independent claims 1 and 21. Accordingly, the rejection of independent claims 1 and 21, and the several claims dependent thereon, cannot be said to be obvious from Jin et al.

It is not seen that any of the secondary references taken alone or in combination with Jin et al. supply the missing teachings to Jin et al. to achieve or render obvious any of Applicant's claims. Schertler (U.S. Patent No. 4,461,665) and Ichinose et al. (U.S. Patent No. 4,224,379), which have been cited as teaching that metal substrate/assemblies can be heated by irradiating an infrared ray onto a substrate, are quite remote. Neither reference is concerned with the processing of nanotubes. Thus, there is no motivation to combine Jin et al., Schertler and/or Ichinose et al. to achieve or render obvious independent claims 1 and 21, and claims 4, 5, 22 and 23, which depend thereon.

Turning to the rejection of claims 6 and 24 as obvious from Jin et al. in view of either Tanabe et al. (U.S. Patent No. 6,296,894) or Nagashima et al. (U.S. Patent No. 6,101,316), these references are equally remote. Again, neither is concerned with the processing of nanotubes. Moreover, neither Tanabe et al. nor Nagashima et al. supplies the missing teachings to Jin et al. to achieve or render obvious claim 1 or claim 21, or claims 6 and 24, which depend thereon.

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Thus, no combination of Jin et al., Tanabe et al. and/or Nagashima et al. would achieve or render obvious claims 6 and 24.

Turning to the rejection of claims 12 and 30 as obvious from Jin et al. in view of Cohen et al. (U.S. Patent No. 6,231,980) and either Nakai et al. (U.S. Patent No. 4,389,465) or Henney et al. (U.S. Patent No. 3,811,928), and the rejection of claims 15, 16, 33 and 34 as obvious from Jin et al. in view of Cohen et al. and Nakai et al., all of these claims are depend directly or indirectly on independent claims 1 and 21. The deficiencies of the primary reference Jin et al. vis-à-vis independent claims 1 and 21 are discussed above. None of the secondary references Cohen et al., Nakai et al. and Henney et al. supplies the missing teachings to Jin et al. as above discussed. Of these references, only Cohen et al. is concerned with processing nanotubes. However, aside from this common touchstone with Applicant's claimed invention, all of the secondary references are quite remote. None of the secondary references supplies the missing teachings to Jin et al., as above described, to achieve or render obvious claim 1 or claim 21, or any of the claims dependent thereon. Accordingly, the rejection of claims 12 and 30 as obvious from Jin et al. in view of Cohen et al. and either Nakai et al. or Henney et al., and the rejection of claims 15, 16, 33 and 34 as obvious from Jin et al. in view of Cohen et al. and Nakai et al., is also in error.

Having dealt with all the objections raised by the Examiner, the Application is believed to be in order for allowance. Early and favorable action are respectfully requested.

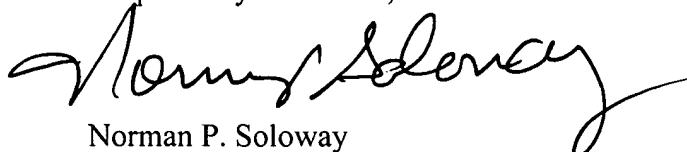
A credit card authorization Form PTO-2038 in the amount \$420.00 in payment of the Petition for Two-Month Extension of Time accompanies this Amendment.

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In the event there are any fee deficiencies or additional fees are payable, please charge them (or credit any overpayment) to our Deposit Account Number 08-1391.

Respectfully submitted,



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I hereby certify that this correspondence is being deposited with the United States Postal Service as First Class Mail in an envelope addressed to: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450 on June 25, 2004, at Tucson, Arizona.

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